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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/893,966	06/29/2001	Soon Sung Yoo	8733.474.00	6119

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EXAMINER
MOHAMEDULLA, SALEHA R

ART UNIT	PAPER NUMBER
1756	

DATE MAILED: 08/29/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/893,966	YOO ET AL.	
	Examiner	Art Unit	
	Saleha R. Mohamedulla	1756	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 29 June 2001.
- 2a) This action is **FINAL**. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-16 is/are pending in the application.
 - 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) 1 and 7-10 is/are allowed.
- 6) Claim(s) 2-6 and 12-15 is/are rejected.
- 7) Claim(s) 11 and 16 is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 29 June 2001 is/are: a) accepted or b) objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) The proposed drawing correction filed on _____ is: a) approved b) disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.
- 12) The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.
- 14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
 - a) The translation of the foreign language provisional application has been received.
- 15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) Interview Summary (PTO-413) Paper No(s) _____.
- 5) Notice of Informal Patent Application (PTO-152)
- 6) Other: _____.

DETAILED ACTION

Claims 1-16 are pending.

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: A, 1a, 2a, 3a, 4a, 5a and 5b. A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

2. The abstract of the disclosure is objected to because it does not contain clear and concise language when describing the shape of the fine patterns. All that is shown in the abstract with respect to this pattern is a hand drawing (line 4). The dimensions of the pattern are unclear. It is also unclear whether the dimensions of the pattern are material. The drawing does not show important characteristics of the pattern. All that is given is a general shape. Correction is required. See MPEP § 608.01(b).

3. The disclosure is objected to because of the following informalities:
On page 9, line 24, “from” should be inserted before “suffering.”
On page 12, line 21, “from” should be inserted before “suffering.”
On page 13, line 2, “of” should be deleted.

On page 13, line 17, “embodiment” should be inserted after “in the second.”

On page 14, line 7, “of” should be inserted after “formation.”

Appropriate correction is required.

Claim Objections

4. Claims 4, 11, 12, 14, 15 and 16 are objected to because of the following informalities:

In claim 4, line 1, “;” should be “:”

In claim 4, line 2, “pattern” should be inserted after “bar.”

In claim 11, lines 6, 9, 12, and 13, “lightening” should be “lightning.”

In claim 12, line 3, “the” should be inserted before “pad.”

In claim 12, lines 10 and 12, “lightening” should be “lightning.”

In claim 14, line 3, “the” should be inserted before “pad.”

In claim 14, lines 8, 11, 14, 16, 17, 18 and 19, “lightening” should be “lightning.”

In claim 15, line 3, “the” should be inserted before “pad.”

In claim 15, lines 5, 8, 10, 11 and 12 “lightening” should be “lightning.”

In claim 15, line 11, the phrase “a the” does not make sense.

In claim 15, line 12, before “the outer,” delete “to.”

In claim 16, line 4, “the” should be inserted before “pad.”

In claim 16, lines 6, 9, 11 and 12, “lightening” should be “lightning.”

Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 2 and 13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 2 and 13 include a hand drawing of the fine pattern. It is unclear as to what the material limitations of the fine pattern are. The dimensions of the pattern are unclear. It is also unclear whether the dimensions of the pattern are material. The drawing does not show important characteristics of the pattern. All that is given is a general shape.

The claims should point out with particularity the subject matter of the invention.

Drawings are not appropriate for claimed subject matter because the scope of the claims is not easily discernible. Entire figures from the specification cannot be printed into claims. The limitations of the fine pattern cannot be determined from the general-shaped hand drawing. The material characteristics of the fine pattern should be described in words, provided that 35 U.S.C. 112, first paragraph will not be violated.

Correction is required.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over US# 6,025,891 to Kim in view of US# 6,365,303 to Hung et al.

Kim teaches a liquid crystal display device having electrostatic discharge protection (col. 1, lines 27-32). In Figures 2 and 3(a), Kim teaches a shorting bar 5 connected to respective gate line pads 3 through switching device 12 (col. 4, lines 5-20). The switching device may be a transistor or a diode (col. 4, lines 23-27; col. 4, line 65 – col. 5, line 5). As shown in Figure 3(a), lightning rods connect the shorting bar 5 to the switching device 12 and the pad 3 to the switching device 12. Therefore, Kim teaches a shorting bar and a plurality of pads, and a plurality of lightning rods between the shorting bar and each of the pads.

Kim teaches the liquid crystal display device comprising the bar, rods and pads but does not teach a photomask with patterns of the bar, rods and pads. Hung teaches a photomask having electrostatic discharge damage protection on the mask. The mask includes ESD fingers, or lightning rods, 36 and 38 that connect metal border regions 30 and 34 (Abstract). One end of each of the conductive fingers 38 makes electrical contact with the metal of region 30 and one end of each of the conductive fingers 36 makes electrical contact with metal region 34 (col. 2, line 60-col. 3, line 5). Therefore, the ESD fingers, or lightning rods, connect two metallic conductive regions.

The references are analogous art as they are drawn to electrostatic discharge prevention. It would have been obvious to one of ordinary skill in the art to form patterns on a photomask that have the shape and form of the shorting bar, lightning rods and pads of Kim as Hung shows

that one photomask can have patterns where lightning rod regions connect two other conductive regions. One of ordinary skill in the art would have a reasonable expectation of success in placing a shorting bar pattern and pad patterns in place of the two conductive regions on Hung as the shorting bar and pads are conductive metals and photomasks are used to pattern a variety of integrated circuits, including liquid crystal displays.

9. Claims 2, 4-6 and 12-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over US# 6,025,891 to Kim in view of US# 6,365,303 to Hung et al., and as applied to claim 3 above concerning the dependence of claim 4, in further view of US# 6,265,756 to Brockett et al.

Kim teaches a liquid crystal display device having electrostatic discharge protection (col. 1, lines 27-32). In Figures 2 and 3(a), Kim teaches a shorting bar 5 or 6 connected to respective gate line pads 3 or data line pads 4 through switching device 12 (col. 4, lines 5-20). The switching device may be a transistor or a diode (col. 4, lines 23-27; col. 4, line 65 – col. 5, line 5). As shown in Figure 3(a), lightning rods connect the shorting bar 5 to the switching device 12 and the pad 3 to the switching device 12. Therefore, Kim teaches a shorting bar and a plurality of pads, an outer lightning rod connected to the shorting bar, and inner lightning rods connected to each of the pads. Kim teaches that a fine pattern, that is, the switching device 12, connects the inner and outer lightning rods. The present disclosure does not define what is meant by fine. As shown in Figure 3(a) of Kim, the switching device has a shape with lines and right angles similar to the hand drawn shape included in claims 2 and 13. Also, because Kim teaches data line pads, Kim teaches that the pads are for a signal line.

Kim teaches the liquid crystal display device comprising the bar, rods and pads but does not teach a photomask with patterns of the bar, rods and pads. Hung teaches a photomask having electrostatic discharge damage protection on the mask. The mask includes ESD fingers, or lightning rods, 36 and 38 that connect metal border regions 30 and 34 (Abstract). One end of each of the conductive fingers 38 makes electrical contact with the metal of region 30 and one end of each of the conductive fingers 36 makes electrical contact with metal region 34 (col. 2, line 60-col. 3, line 5). Therefore, the ESD fingers, or lightning rods, connect two metallic conductive regions.

The references are analogous art as they are drawn to electrostatic discharge prevention. It would have been obvious to one of ordinary skill in the art to form patterns on a photomask that have the shape and form of the shorting bar, lightning rods and pads of Kim as Hung shows that one photomask can have patterns where lightning rod regions connect two other conductive regions. One of ordinary skill in the art would have a reasonable expectation of success in placing a shorting bar pattern and pad patterns in place of the two conductive regions on Hung as the shorting bar and pads are conductive metals and photomasks are used to pattern a variety of integrated circuits, including liquid crystal displays.

Kim in view of Hung does not teach that the lightning rod patterns have projections. Brockett teaches an electrostatic discharge device. In Figure 1, Brockett teaches circuitry 12 connected to a set of pads 14 by lines 16 (col. 2, lines 15-25). An electrostatic discharge (ESD) protection device 18 is connected to each line 16 (col. 2, lines 25-30). As shown in Figure 1, the line 16 connected to the second pad 14 has a projection that turns downwards and then upwards

to connect to the second device 18. The line connected to circuitry 12 (second line) has a projection that turns downward to connect to device 18. Therefore, Brockett teaches that the lines 16, or lightning rods, have projections that are connected to an ESD protection device 18, which is also a fine pattern. Brockett also teaches claim 5 and 15 limitations that the fine pattern device 18 connects between centers of the projections. Also, as shown in Figure 1, the distance between the projections of the rods is greater than the distance between the rods themselves. The rods themselves meet at a point above the second device 18, while there is space between the projections of the rods. Therefore, the limitations of claim 6 are met. Brockett also teaches that the length of the device 18 is greater than the distance between the projections. Device 18 is shown in Figure 2A. The length of the contact regions within device 18 is 100 microns (col. 2, lines 35-50). As shown in Figure 2A, the device itself is longer than the contact regions. Therefore, the limitations of claim 12 are met. The limitations of claim 14 are met as Brockett teaches multiple devices 18 are connected through multiple inner and outer lightning rod projections.

The references are analogous art as they are drawn to electrostatic discharge protection devices in semiconductor processing. It would have been obvious to one of ordinary skill in the art to include the projections of Brockett on the lightning rods of Kim in order to form a more intricate and advanced integrated circuit device. One of ordinary skill in the art would have a reasonable expectation of success in using the projections as the projections of Brockett connect to the device 18 in the same way that the rods of Kim connect to the switching device 12. Also, it would be obvious to one of ordinary skill in the art to use the circuitry 12 of Brockett as the shorting bar of Kim as Brockett teaches that block 12 can be integrated circuitry.

Allowable Subject Matter

10. Claims 1 and 7-10 are allowed. Claims 11 and 16 would be allowable if amended to overcome the objections to the claims. The prior art does not teach or suggest the photo mask set where the second mask has a contact hole at a position matched to the location of fine pattern on the first photo mask. The prior art does not teach or suggest a redundancy fine pattern connected between the pad patterns. The prior art does not teach or suggest a photo mask set where a first mask has a shorting bar pattern and an outer lightning rod pattern connected to the bar pattern and a second mask with a pad pattern and an inner lightning rod pattern connected to the pad pattern.

Conclusion

11. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Saleha Mohamedulla whose telephone number is (703) 308-1260. The Examiner can normally be reached Monday-Friday, from 8:00 AM to 4:30 PM. If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Mark Huff, can be reached on (703) 308-2464. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9310. The After Final fax phone number is (703) 872-9311. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.



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August 25, 2003